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**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

- 1           1.       (Currently amended) A method of detecting one of a set of preamble
- 2 sequences in a spread signal comprising the steps of:
- 3           (a) correlating the received spread signal with sequences of a first orthogonal Gold
- 4 code (OGC) set in accordance with a first fast transform to provide a preamble signal;
- 5           (b) correlating the preamble signal with the set of preamble sequences in
- 6 accordance with a second fast transform to generate a set of index values;
- 7           (c) forming a decision statistic based on the set of index values; and
- 8           (d) selecting, as the detected one of the set of preamble sequences, a preamble
- 9 sequence corresponding to the decision statistic;
- 10           wherein step (c) comprises the steps of:
- 11           1) forming an initial decision statistic based on the relative maximum index of the
- 12 set of index values;
- 13           2) selecting the signal generated by the preamble sequence combined with the
- 14 preamble signal corresponding to the initial decision statistic;
- 15           3) adjusting, in one or more of amplitude and phase, the signal selected in step 2);
- 16 and
- 17           4) forming the decision statistic based on the adjusted signal.

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1           2.       (Original) The invention as recited in claim 1, wherein, for step (a), the  
2 first fast transform method is a fast orthogonal Gold code transform (FOGT) comprising  
3 the steps of

4           1) multiplying the received spread signal with a first sequence vector and a  
5 forward permutation vector to generate a permuted sequence signal, wherein:

6                   the first OGC set is generated from the first sequence vector and a cyclic  
7 shift matrix of a second sequence vector, and the forward permutation vector  
8 maps between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamard  
9 sequences; and

10          2) applying the fast Hadamaard transform to the permuted sequence signal to  
11 generate a set of correlated signals, the preamble signal selected as one of the set of  
12 correlated signals based on a predetermined decision criterion.

1           3.       (Original) The invention as recited in claim 1, wherein:

2           for step (b), the set of preamble sequences are selected from a second OGC set  
3 formed from first and second sequence vectors, the second OGC set generated from the  
4 first sequence vector and a cyclic shift matrix of a second sequence vector; and wherein

5           the second fast transform is a fast orthogonal Gold code transform (FOGT)  
6 comprising the steps of

7                   1) multiplying the preamble signal with a first sequence vector and a  
8 forward permutation vector to generate a permuted preamble signal, the forward  
9 permutation vector mapping between i) the cyclic shift matrix and ii) a matrix of  
10 Walsh-Hadamard sequences, and

11                  2) applying the fast Hadamaard transform to the permuted preamble signal  
12 to generate the set of index values.

1           4.       (Original) The invention as recited in claim 1, wherein, for step (b), the set  
2 of preamble sequences are selected from set of Walsh-Hadamard sequences, and the  
3 second fast transform is a fast Hadamaard transform.

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1           5.       (Original) The invention as recited in claim 1, wherein, for step (a), the  
2 received spread signal is a burst of a random-access channel in a code-division, multiple-  
3 access communication system.

1           6.       (Cancelled)

1           7.       (Currently amended) The invention as recited in claim 6 1, wherein step  
2 (c3) adjusts the selected signal by estimating a channel response from the preamble  
3 signal, forming a de-rotation signal from the preamble signal, and combining the de-  
4 rotation signal with the preamble signal for coherent sequence detection.

1           8.       (Currently amended) The invention as recited in claim 6 1, wherein step  
2 (c2) employs the initial decision statistic to locally generate a corresponding preamble  
3 sequence, the locally generated preamble sequence being combined with the preamble  
4 signal f

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5           9.       (Currently amended) A method of detecting one of a set of preamble  
6 sequences in a spread signal comprising the steps of:

7           (a) correlating the received spread signal with a set of orthogonal sequences to  
8 provide a preamble signal;

9           (b) correlating the preamble signal with one or more preamble sequences of an  
10 orthogonal Gold code (OGC) set in accordance with a fast transform to generate a set of  
11 index values;

12          (c) forming a decision statistic based on the set of index values; and

13          (d) selecting, as the detected one of the set of preamble sequences, a preamble  
14 sequence corresponding to the decision statistic;

15          wherein step (c) comprises the steps of:

16           1) forming an initial decision statistic based on the relative maximum index of the  
17 set of index values;

18           2) selecting the signal generated by the preamble sequence combined with the  
19 preamble signal corresponding to the initial decision statistic;

20           3) adjusting, in one or more of amplitude and phase, the signal selected in step 2);

21          and

22           4) forming the decision statistic based on the adjusted signal.

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- 1           10.     (Original) The invention as recited in claim 9, wherein:
- 2           for step (b), each preamble sequence is selected from the OGC set formed from
- 3     first and second sequence vectors, wherein the OGC set is generated from the first
- 4     sequence vector and a cyclic shift matrix of a second sequence vector; and wherein
- 5           the fast transform is a fast orthogonal Gold code transform (FOGT) comprising
- 6     the steps of
- 7           1) multiplying the preamble signal with a first sequence vector and a forward
- 8     permutation vector to generate a permuted preamble signal, the forward permutation
- 9     vector mapping between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamard
- 10    sequences; and
- 11          2) applying the fast Hadamard transform to the permuted preamble signal to
- 12    generate the set of index values.

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1           11.   (Currently amended) A preamble detector for detecting one of a set of  
2 preamble sequences in a spread signal, the preamble detector comprising:

3           a first correlator correlating the received spread signal with sequences of a first  
4 orthogonal Gold code (OGC) set in accordance with a first fast transform to provide a  
5 preamble signal;

6           a second correlator correlating the preamble signal with the set of preamble  
7 sequences in accordance with a second fast transform method to generate a set of index  
8 values;

9           a circuit forming a decision statistic based on the set of index values; and

10          a selector selecting, as the detected one of the set of preamble sequences, a  
11 preamble sequence corresponding to the decision statistic;

12          wherein the circuit forming the decision statistic comprises:

13          a first magnitude detector forming an initial decision statistic based on the relative  
14 maximum index of the set of index values;

15          a signal selector selecting the signal generated by the preamble sequence  
16 combined with the preamble signal corresponding to the initial decision statistic;

17          a coherent detector adjusting, in one or more of amplitude and phase, the signal  
18 selected in step 2); and

19          a second magnitude detector forming the decision statistic based on the adjusted  
20 signal.

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1           12.   (Original) The invention as recited in claim 11, wherein the first fast  
2 transform is a fast orthogonal Gold code transform (FOGT), the first OGC set is  
3 generated from a first sequence vector and a cyclic shift matrix of a second sequence  
4 vector, and the forward permutation vector maps between i) the cyclic shift matrix and ii)  
5 a matrix of Walsh-Hadamaard sequences; and wherein:

6           the first correlator comprises:

7                   a multiplier multiplying the received spread signal with the first sequence  
8 vector and a forward permutation vector to generate a permuted sequence signal;  
9 and

10                   a combiner applying the fast Hadamaard transform to the permuted  
11 sequence signal to generate a set of correlated signals, the preamble signal  
12 selected as one of the set of correlated signals based on a predetermined decision  
13 criterion.

1           13.   (Original) The invention as recited in claim 11, wherein:

2           the set of preamble sequences is selected from a second OGC set formed from  
3 first and second sequence vectors, the second OGC set generated from the first sequence  
4 vector and a cyclic shift matrix of a second sequence vector; and the second fast  
5 transform is a fast orthogonal Gold code transform (FOGT); and wherein:

6           the second correlator comprises:

7                   a multiplier multiplying the preamble signal with a first sequence vector  
8 and a forward permutation vector to generate a permuted preamble signal, the  
9 forward permutation vector mapping between i) the cyclic shift matrix and ii) a  
10 matrix of Walsh-Hadamaard sequences, and

11                   a combiner applying the fast Hadamaard transform to the permuted  
12 preamble signal to generate the set of index values.

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1           14.    (Original) The invention as recited in claim 11, wherein the set of  
2   preamble sequences is selected from a set of Walsh-Hadamard sequences, and the  
3   second fast transform is a fast Hadamard transform.

1           15.    (Original) The invention as recited in claim 11, wherein the received  
2   spread signal is a burst of a random-access channel in a code-division, multiple-access  
3   communication system.

1           16.    (Cancelled)

1           17.    (Currently amended) The invention as recited in claim ~~16~~ 11, wherein the  
2   coherent detector includes a channel estimator for i) estimating a channel response from  
3   the preamble signal, and ii) forming a de-rotation signal from the preamble signal, and a  
4   combiner for combining the de-rotation signal with the preamble signal for coherent  
5   sequence detection.

1           18.    (Currently amended) The invention as recited in claim ~~16~~ 11, wherein the  
2   coherent detector includes a sequence generator, the sequence generator employing the  
3   initial decision statistic to locally generate a corresponding preamble sequence; and a  
4   combiner combining the locally generated preamble sequence with the preamble signal  
5   for coherent sequence detection.

1           19.    (Original) The invention as recited in claim 11, wherein the preamble  
2   detector is embodied in an integrated circuit.

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1           20.     (Currently amended) A preamble detector for detecting one of a set of  
2 preamble sequences in a spread signal comprising ~~the steps of~~:  
3           a first correlator correlating the received spread signal with a set of orthogonal  
4 sequences to provide a preamble signal;  
5           a second correlator correlating the preamble signal with one or more preamble  
6 sequences of an orthogonal Gold code (OGC) set in accordance with a fast transform to  
7 generate a set of index values;  
8           a circuit forming a decision statistic based on the set of index values; and  
9           a selector selecting, as the detected one of the set of preamble sequences, a  
10 preamble sequence corresponding to the decision statistic;  
11           wherein the circuit forming the decision statistic comprises:  
12           a first magnitude detector forming an initial decision statistic based on the relative  
13 maximum index of the set of index values;  
14           a signal selector selecting the signal generated by the preamble sequence  
15 combined with the preamble signal corresponding to the initial decision statistic;  
16           a coherent detector adjusting, in one or more of amplitude and phase, the signal  
17 selected in step 2); and  
18           a second magnitude detector forming the decision statistic based on the adjusted  
19 signal.

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1           21.     (Original) The invention as recited in claim 20, wherein:  
2           each preamble sequence is selected from the OGC set formed from first and  
3           second sequence vectors, wherein the OGC set is generated from the first sequence vector  
4           and a cyclic shift matrix of a second sequence vector and the fast transform is a fast  
5           orthogonal Gold code transform (FOGT); and wherein  
6           the second correlator comprises:  
7           a multiplier multiplying the preamble signal with a first sequence vector and a  
8           forward permutation vector to generate a permuted preamble signal, the forward  
9           permutation vector mapping between i) the cyclic shift matrix and ii) a matrix of Walsh-  
10          Hadamard sequences; and  
11          a combiner applying the fast Hadamard transform to the permuted preamble  
12          signal to generate the set of index values.

1           22.     (Original) The invention as recited in claim 20, wherein the preamble  
2           detector is embodied in an integrated circuit.

23-29. (Cancelled)